

SEQUENCE LISTING

<110> Johnson, Gary L.

<120> MEKK1 PROTEINS AND FRAGMENTS THEREOF FOR USE IN REGULATING
APOPTOSIS

<130> CPI-042CPPC

<140> PCT/US99/02974

<141> February 12, 1999

<160> 21

<170> PatentIn Ver. 2.0

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Ala Pro Ser Arg Asn Thr Ile Gln Lys Phe Val Ser Arg Met Ser Asn	
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tct cac aca ctg tca tcg tct agc aca tcc aca tct agt tca gaa aac	1298
Ser His Thr Leu Ser Ser Ser Ser Thr Ser Thr Ser Ser Ser Glu Asn	
415 420 425	
agc atc aag gat gaa gag gag cag atg tgt ccc atc tgc ttg ctg ggc	1346
Ser Ile Lys Asp Glu Glu Glu Gln Met Cys Pro Ile Cys Leu Leu Gly	
430 435 440	
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Met Leu Asp Glu Glu Ser Leu Thr Val Cys Glu Asp Gly Cys Arg Asn	
445 450 455 460	
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Lys Leu His His His Cys Met Ser Ile Trp Ala Glu Glu Cys Arg Arg	
465 470 475	
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Asn Arg Glu Pro Leu Ile Cys Pro Leu Cys Arg Ser Lys Trp Arg Ser	
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His Asp Phe Tyr Ser His Glu Leu Ser Ser Pro Val Glu Ser Pro Ala	
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Ser Leu Arg Ala Val Gln Gln Pro Ser Ser Pro Gln Gln Pro Val Ala	
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Gly Ser Gln Arg Arg Asn Gln Glu Ser Ser Phe Asn Leu Thr His Phe	
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Gly Thr Gln Gln Ile Pro Ser Ala Tyr Lys Asp Leu Ala Glu Pro Trp	
545 550 555	
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Ile Gln Val Phe Gly Met Glu Leu Val Gly Cys Leu Phe Ser Arg Asn	
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Trp Asn Val Arg Glu Met Ala Leu Arg Arg Leu Ser His Asp Val Ser	
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Gly Ala Leu Leu Leu Ala Asn Gly Glu Ser Thr Gly Asn Ser Gly Gly	
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605 610 615 620	
ccc agc atc tca ggg gat gtg gtg gag gcg tgc tgc agt gtc ctg tct	1922
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Ile Val Cys Ala Asp Pro Val Tyr Lys Val Tyr Val Ala Ala Leu Lys	
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Thr Leu Arg Ala Met Leu Val Tyr Thr Pro Cys His Ser Leu Ala Glu	
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Arg Ile Lys Leu Gln Arg Leu Leu Arg Pro Val Val Asp Thr Ile Leu	
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Val Lys Cys Ala Asp Ala Asn Ser Arg Thr Ser Gln Leu Ser Ile Ser	
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Arg Glu Ile Leu Lys Ala Gly Ser Ile Gly Val Gly Gly Val Asp Tyr	
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Val Leu Ser Cys Ile Leu Gly Asn Gln Ala Glu Ser Asn Asn Trp Gln	
735 740 745	
gaa ctg ctg ggt cgc ctc tgt ctt ata gac agg ttg ctg ttg gaa ttt	2306
Glu Leu Leu Gly Arg Leu Cys Leu Ile Asp Arg Leu Leu Leu Glu Phe	
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cct gct gaa ttc tat cct cat att gtc agt act gat gtc tca caa gct	2354
Pro Ala Glu Phe Tyr Pro His Ile Val Ser Thr Asp Val Ser Gln Ala	
765 770 775 780	
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Glu Pro Val Glu Ile Arg Tyr Lys Lys Leu Leu Ser Leu Leu Thr Phe	
785 790 795	
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Ala Leu Gln Ser Ile Asp Asn Ser His Ser Met Val Gly Lys Leu Ser	
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815 820 825	
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Val Phe Ser Lys Leu Val Thr Met Leu Asn Ala Ser Gly Ser Thr His	
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ttc acc agg atg cgc cgg cgt ctg atg gct atc gcg gat gag gta gaa	2594
Phe Thr Arg Met Arg Arg Arg Leu Met Ala Ile Ala Asp Glu Val Glu	
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Ile Ala Glu Val Ile Gln Leu Gly Val Glu Asp Thr Val Asp Gly His	
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Gln Asp Ser Leu Gln Ala Val Ala Pro Thr Ser Cys Leu Glu Asn Ser	
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Ala Thr Arg Leu Ser Ala Ser Ser Glu Asp Ile Ser Asp Arg Leu Ala	
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Cys Ser Ser Ala Pro Ser Val Pro Asp Ile Ser Lys His Arg Pro Gln	
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Asn Ile His Arg Pro Lys Pro Ser Arg Pro Val Pro Gly Ser Thr Ser	
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Lys Leu Gly Asp Ala Thr Lys Ser Ser Met Thr Leu Asp Leu Gly Ser	
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Cys Arg Leu Asp Val Asn Thr Glu Leu Asn Ser Ser Ile Glu Asp Leu	
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5253

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<213> Mus musculus

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Ala Leu Gln Gly Ser Gly Ala Pro Ala Ala Gly Ala Ala Gly Leu Leu
35 40 45

Arg Glu Pro Gly Ser Ala Gly Arg Glu Arg Ala Asp Trp Arg Arg Arg
50 55 60

His Val Arg Lys Val Arg Ser Val Glu Leu Asp Gln Leu Pro Glu Gln
65 70 75 80

Pro Leu Phe Leu Ala Ala Ala Ser Pro Pro Cys Pro Ser Thr Ser Pro
85 90 95

Ser Pro Glu Pro Ala Asp Ala Ala Ala Gly Ala Ser Arg Phe Gln Pro
100 105 110

Ala Ala Gly Pro Pro Pro Pro Gly Ala Ala Ser Arg Cys Gly Ser His
115 120 125

Ser Ala Glu Leu Ala Ala Ala Arg Asp Ser Gly Ala Arg Ser Pro Ala
130 135 140

Gly Ala Glu Pro Pro Ser Ala Ala Ala Pro Ser Gly Arg Glu Met Glu
145 150 155 160

Asn Lys Glu Thr Leu Lys Gly Leu His Lys Met Glu Asp Arg Pro Glu
165 170 175

Glu Arg Met Ile Arg Glu Lys Leu Lys Ala Thr Cys Met Pro Ala Trp
180 185 190

Lys His Glu Trp Leu Glu Arg Arg Asn Arg Arg Gly Pro Val Val Val
195 200 205

Lys Pro Ile Pro Ile Lys Gly Asp Gly Ser Glu Val Asn Asn Leu Ala
210 215 220

Ala Glu Pro Gln Gly Glu Gly Gln Ala Gly Ser Ala Ala Pro Ala Pro
225 230 235 240

Lys Gly Arg Arg Ser Pro Ser Pro Gly Ser Ser Pro Ser Gly Arg Ser
245 250 255

Val Lys Pro Glu Ser Pro Gly Val Arg Arg Lys Arg Val Ser Pro Val
260 265 270

Pro	Phe	Gln	Ser	Gly	Arg	Ile	Thr	Pro	Pro	Arg	Arg	Ala	Pro	Ser	Pro	275	280	285
Asp	Gly	Phe	Ser	Pro	Tyr	Ser	Pro	Glu	Glu	Thr	Ser	Arg	Arg	Val	Asn	290	295	300
Lys	Val	Met	Arg	Ala	Arg	Leu	Tyr	Leu	Leu	Gln	Gln	Ile	Gly	Pro	Asn	305	310	315
Ser	Phe	Leu	Ile	Gly	Gly	Asp	Ser	Pro	Asp	Asn	Lys	Tyr	Arg	Val	Phe	325	330	335
Ile	Gly	Pro	Gln	Asn	Cys	Ser	Cys	Gly	Arg	Gly	Ala	Phe	Cys	Ile	His	340	345	350
Leu	Leu	Phe	Val	Met	Leu	Arg	Val	Phe	Gln	Leu	Glu	Pro	Ser	Asp	Pro	355	360	365
Met	Leu	Trp	Arg	Lys	Thr	Leu	Lys	Asn	Phe	Glu	Val	Glu	Ser	Leu	Phe	370	375	380
Gln	Lys	Tyr	His	Ser	Arg	Arg	Ser	Ser	Arg	Ile	Lys	Ala	Pro	Ser	Arg	385	390	395
Asn	Thr	Ile	Gln	Lys	Phe	Val	Ser	Arg	Met	Ser	Asn	Ser	His	Thr	Leu	405	410	415
Ser	Ser	Ser	Ser	Thr	Ser	Thr	Ser	Ser	Ser	Glu	Asn	Ser	Ile	Lys	Asp	420	425	430
Glu	Glu	Glu	Gln	Met	Cys	Pro	Ile	Cys	Leu	Leu	Gly	Met	Leu	Asp	Glu	435	440	445
Glu	Ser	Leu	Thr	Val	Cys	Glu	Asp	Gly	Cys	Arg	Asn	Lys	Leu	His	His	450	455	460
His	Cys	Met	Ser	Ile	Trp	Ala	Glu	Glu	Cys	Arg	Arg	Asn	Arg	Glu	Pro	465	470	475
Leu	Ile	Cys	Pro	Leu	Cys	Arg	Ser	Lys	Trp	Arg	Ser	His	Asp	Phe	Tyr	485	490	495
Ser	His	Glu	Leu	Ser	Ser	Pro	Val	Glu	Ser	Pro	Ala	Ser	Leu	Arg	Ala	500	505	510
Val	Gln	Gln	Pro	Ser	Ser	Pro	Gln	Gln	Pro	Val	Ala	Gly	Ser	Gln	Arg	515	520	525
Arg	Asn	Gln	Glu	Ser	Ser	Phe	Asn	Leu	Thr	His	Phe	Gly	Thr	Gln	Gln	530	535	540
Ile	Pro	Ser	Ala	Tyr	Lys	Asp	Leu	Ala	Glu	Pro	Trp	Ile	Gln	Val	Phe	545	550	555
Gly	Met	Glu	Leu	Val	Gly	Cys	Leu	Phe	Ser	Arg	Asn	Trp	Asn	Val	Arg	565	570	575
Glu	Met	Ala	Leu	Arg	Arg	Leu	Ser	His	Asp	Val	Ser	Gly	Ala	Leu	Leu	580	585	590

Leu	Ala	Asn	Gly	Glu	Ser	Thr	Gly	Asn	Ser	Gly	Gly	Gly	Ser	Gly	Gly		
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Asp	Pro	Val	Tyr	Lys	Val	Tyr	Val	Ala	Ala	Leu	Lys	Thr	Leu	Arg	Ala		
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Met	Leu	Val	Tyr	Thr	Pro	Cys	His	Ser	Leu	Ala	Glu	Arg	Ile	Lys	Leu		
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Gln	Arg	Leu	Leu	Arg	Pro	Val	Val	Asp	Thr	Ile	Leu	Val	Lys	Cys	Ala		
		675					680					685					
Asp	Ala	Asn	Ser	Arg	Thr	Ser	Gln	Leu	Ser	Ile	Ser	Thr	Val	Leu	Glu		
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Ile	Leu	Gly	Asn	Gln	Ala	Glu	Ser	Asn	Asn	Trp	Gln	Glu	Leu	Leu	Gly		
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Tyr	Pro	His	Ile	Val	Ser	Thr	Asp	Val	Ser	Gln	Ala	Glu	Pro	Val	Glu		
	770					775					780						
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785					790					795					800		
Ile	Asp	Asn	Ser	His	Ser	Met	Val	Gly	Lys	Leu	Ser	Arg	Arg	Ile	Tyr		
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		835					840					845					
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	850					855					860						
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			900					905					910				

Ser Ala Ser Ser Glu Asp Ile Ser Asp Arg Leu Ala Gly Val Ser Val
915 920 925

Gly Leu Pro Ser Ser Thr Thr Thr Glu Gln Pro Lys Pro Ala Val Gln
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Thr Lys Gly Arg Pro His Ser Gln Cys Leu Asn Ser Ser Pro Leu Ser
945 950 955 960

His Ala Gln Leu Met Phe Pro Ala Pro Ser Ala Pro Cys Ser Ser Ala
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Pro Ser Val Pro Asp Ile Ser Lys His Arg Pro Gln Ala Phe Val Pro
980 985 990

Cys Lys Ile Pro Ser Ala Ser Pro Gln Thr Gln Arg Lys Phe Ser Leu
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Gln Phe Gln Arg Asn Cys Ser Glu His Arg Asp Ser Asp Gln Leu Ser
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Pro Val Phe Thr Gln Ser Arg Pro Pro Pro Ser Ser Asn Ile His Arg
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Pro Lys Pro Ser Arg Pro Val Pro Gly Ser Thr Ser Lys Leu Gly Asp
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Ala Thr Lys Ser Ser Met Thr Leu Asp Leu Gly Ser Ala Ser Arg Cys
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Asp Asp Ser Phe Gly Gly Gly Gly Asn Ser Gly Asn Ala Val Ile Pro
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Ser Asp Glu Thr Val Phe Thr Pro Val Glu Asp Lys Cys Arg Leu Asp
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Val Asn Thr Glu Leu Asn Ser Ser Ile Glu Asp Leu Leu Glu Ala Ser
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Met Pro Ser Ser Asp Thr Thr Val Thr Phe Lys Ser Glu Val Ala Val
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Leu Ser Pro Glu Lys Ala Glu Asn Asp Asp Thr Tyr Lys Asp Asp Val
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His Leu Asn His Pro Asn Ile Ile Arg Met Leu Gly Ala Thr Cys Glu
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Ala His Leu Leu Ser Lys Tyr Gly Ala Phe Lys Glu Ser Val Val Ile
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Asn Tyr Thr Glu Gln Leu Leu Arg Gly Leu Ser Tyr Leu His Glu Asn
1330 1335 1340

Gln Ile Ile His Arg Asp Val Lys Gly Ala Asn Leu Leu Ile Asp Ser
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Thr Gly Gln Arg Leu Arg Ile Ala Asp Phe Gly Ala Ala Ala Arg Leu
1365 1370 1375

Ala Ser Lys Gly Thr Gly Ala Gly Glu Phe Gln Gly Gln Leu Leu Gly
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Cys Ala Lys Pro Pro Trp Asn Ala Glu Lys His Ser Asn His Leu Ala
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Leu Ile Phe Lys Ile Ala Ser Ala Thr Thr Ala Pro Ser Ile Pro Ser
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His Leu Ser Pro Gly Leu Arg Asp Val Ala Val Arg Cys Leu Glu Leu
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Val Val Val Lys Pro Ile Pro Val Lys Gly Asp Gly Ser Glu Met Asn	
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His Leu Ala Ala Glu Ser Pro Gly Glu Val Gln Ala Ser Ala Ala Ser	
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Pro Ala Ser Lys Gly Arg Arg Ser Pro Ser Pro Gly Asn Ser Pro Ser	
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Gly Arg Thr Val Lys Ser Glu Ser Pro Gly Val Arg Arg Lys Arg Val	
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Pro Ser Pro Asp Gly Phe Ser Pro Tyr Ser Pro Glu Glu Thr Asn Arg	
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Pro Ser Arg Asn Thr Ile Gln Lys Phe Val Ser Arg Met Ser Asn Ser	
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Gln	Gln	Ile	Pro	Pro	Ala	Tyr	Lys	Asp	Leu	Ala	Glu	Pro	Trp	Ile	Gln	
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Cys	Ala	Asp	Pro	Val	Tyr	Lys	Val	Tyr	Val	Ala	Ala	Leu	Lys	Thr	Leu	
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Lys Leu Gln Arg Leu Leu Arg Pro Val Val Asp Thr Ile Leu Val Lys	
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Asp Val Asn His Asn Gln Lys Cys Lys Glu Lys Met Glu Ala Glu Glu	
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Glu Glu Ala Leu Ala Ile Ala Met Ala Met Ser Ala Ser Gln Asp Ala	
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1170 1175 1180	

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Tyr Gly Arg Ser Cys Asp Val Trp Ser Val Gly Cys Ala Ile Ile Glu
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Val	Asn	Lys	Val	Met	Arg	Ala	Arg	Leu	Tyr	Leu	Leu	Gln	Gln	Ile	Gly	115	120	125
Pro	Asn	Ser	Phe	Leu	Ile	Gly	Gly	Asp	Ser	Pro	Asp	Asn	Lys	Tyr	Arg	130	135	140
Val	Phe	Ile	Gly	Pro	Gln	Asn	Cys	Ser	Cys	Ala	Arg	Gly	Thr	Phe	Cys	145	150	155
Ile	His	Leu	Leu	Phe	Val	Met	Leu	Arg	Val	Phe	Gln	Leu	Glu	Pro	Ser	165	170	175
Asp	Pro	Met	Leu	Trp	Arg	Lys	Thr	Leu	Lys	Asn	Phe	Glu	Val	Glu	Ser	180	185	190
Leu	Phe	Gln	Lys	Tyr	His	Ser	Arg	Arg	Ser	Ser	Arg	Ile	Lys	Ala	Pro	195	200	205
Ser	Arg	Asn	Thr	Ile	Gln	Lys	Phe	Val	Ser	Arg	Met	Ser	Asn	Ser	His	210	215	220
Thr	Leu	Ser	Ser	Ser	Ser	Thr	Ser	Thr	Ser	Ser	Ser	Val	Asn	Ser	Ile	225	230	235
Lys	Asp	Glu	Glu	Glu	Gln	Met	Cys	Pro	Ile	Cys	Leu	Leu	Gly	Met	Leu	245	250	255
Asp	Glu	Glu	Ser	Leu	Thr	Val	Cys	Glu	Asp	Gly	Cys	Arg	Asn	Lys	Leu	260	265	270
His	His	His	Cys	Met	Ser	Ile	Trp	Ala	Glu	Glu	Cys	Arg	Arg	Asn	Arg	275	280	285
Glu	Pro	Leu	Ile	Cys	Pro	Leu	Cys	Arg	Ser	Lys	Trp	Arg	Ser	His	Asp	290	295	300
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Phe	Gly	Met	Glu	Leu	Val	Gly	Cys	Leu	Phe	Ser	Arg	Asn	Trp	Asn	Val	370	375	380
Arg	Glu	Met	Ala	Leu	Arg	Arg	Leu	Ser	His	Asp	Val	Ser	Gly	Ala	Leu	385	390	395
Leu	Leu	Ala	Asn	Gly	Glu	Ser	Thr	Gly	Asn	Ser	Gly	Gly	Gly	Ser	Gly	405	410	415
Gly	Ser	Leu	Ser	Ala	Gly	Ala	Ala	Ser	Gly	Ser	Ser	Gln	Pro	Ser	Ile	420	425	430

Ser Gly Asp Val Val Glu Ala Cys Cys Ser Val Leu Ser Ile Val Cys
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Ala Asp Pro Val Tyr Lys Val Tyr Val Ala Ala Leu Lys Thr Leu Arg
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Ala Met Leu Val Tyr Thr Pro Cys His Ser Leu Ala Glu Arg Ile Lys
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Leu Gln Arg Leu Leu Arg Pro Val Val Asp Thr Ile Leu Val Lys Cys
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Cys Ile Leu Gly Asn Gln Ala Glu Ser Asn Asn Trp Gln Glu Leu Leu
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Gly Arg Leu Cys Leu Ile Asp Arg Leu Leu Leu Glu Phe Pro Ala Glu
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Phe Tyr Pro His Ile Val Ser Thr Asp Val Ser Gln Ala Glu Pro Val
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Glu Ile Arg Tyr Lys Lys Leu Leu Ser Leu Leu Thr Phe Ala Leu Gln
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Ser Ile Asp Asn Ser His Ser Met Val Gly Lys Leu Ser Arg Arg Ile
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Lys Leu Val Thr Met Leu Asn Ala Ser Gly Ser Thr His Phe Thr Arg
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<141> February 12, 1999

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Arg Pro Val Pro	Gly Ser Thr Ser Lys Leu Gly Asp Ala Thr Lys Ser			
	225	230	235	
agc atg aca ctt	gat ctg ggc agt gct tcc agg tgt gac gac agc ttt			1250
Ser Met Thr Leu	Asp Leu Gly Ser Ala Ser Arg Cys Asp Asp Ser Phe			
	240	245	250	255
ggc ggc ggc ggc	aac agt ggc aac gcc gtc ata ccc agc gac gag aca			1298
Gly Gly Gly Gly	Asn Ser Gly Asn Ala Val Ile Pro Ser Asp Glu Thr			
	260	265	270	
gtg ttc acg ccg	gtg gag gac aag tgc agg tta gat gtg aac acc gag			1346
Val Phe Thr Pro	Val Glu Asp Lys Cys Arg Leu Asp Val Asn Thr Glu			
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ctc aac tcc agc	atc gag gac ctt ctt gaa gca tcc atg cct tca agt			1394
Leu Asn Ser Ser	Ile Glu Asp Leu Leu Glu Ala Ser Met Pro Ser Ser			
	290	295	300	
gac acg aca gtc	act ttc aag tcc gaa gtc gcc gtc ctc tct ccg gaa			1442
Asp Thr Thr Val	Thr Phe Lys Ser Glu Val Ala Val Leu Ser Pro Glu			
	305	310	315	
aag gcc gaa aat	gac gac acc tac aaa gac gac gtc aat cat aat caa			1490
Lys Ala Glu Asn	Asp Asp Thr Tyr Lys Asp Asp Val Asn His Asn Gln			
	320	325	330	335

aag tgc aaa gaa aag atg gaa gct gaa gag gag gag gct tta gcg atc Lys Cys Lys Glu Lys Met Glu Ala Glu Glu Glu Glu Ala Leu Ala Ile 340 345 350	1538
gcc atg gcg atg tca gcg tct cag gat gcc ctc ccc atc gtc cct cag Ala Met Ala Met Ser Ala Ser Gln Asp Ala Leu Pro Ile Val Pro Gln 355 360 365	1586
ctg cag gtg gaa aat gga gaa gat att atc atc att cag cag gac aca Leu Gln Val Glu Asn Gly Glu Asp Ile Ile Ile Ile Gln Gln Asp Thr 370 375 380	1634
cca gaa act ctt cca gga cat acc aaa gcg aaa cag cct tac aga gaa Pro Glu Thr Leu Pro Gly His Thr Lys Ala Lys Gln Pro Tyr Arg Glu 385 390 395	1682
gac gct gag tgg ctg aaa ggc cag cag ata ggc ctc gga gca ttt tct Asp Ala Glu Trp Leu Lys Gly Gln Gln Ile Gly Leu Gly Ala Phe Ser 400 405 410 415	1730
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 580 585 590

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 Val Trp Ser Val Gly Cys Ala Ile Ile Glu Met Ala Cys Ala Lys Pro
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cct tgg aat gca gaa aaa cac tcc aat cat ctc gcc ttg ata ttt aag 2354
 Pro Trp Asn Ala Glu Lys His Ser Asn His Leu Ala Leu Ile Phe Lys
 610 615 620

att gct agc gca act act gca ccg tcc atc ccg tca cac ctg tcc ccg 2402
 Ile Ala Ser Ala Thr Thr Ala Pro Ser Ile Pro Ser His Leu Ser Pro
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 Gly Leu Arg Asp Val Ala Val Arg Cys Leu Glu Leu Gln Pro Gln Asp
 640 645 650 655

cgg cct ccg tcc aga gag ctg ctg aaa cat ccg gtc ttc cgt acc acg 2498
 Arg Pro Pro Ser Arg Glu Leu Leu Lys His Pro Val Phe Arg Thr Thr
 660 665 670

tgg tagttaattg ttcagatcag ctctaattgga gacaggatat cgaaccggga 2551
 Trp

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 Glu Asp Thr Val Asp Gly His Gln Asp Ser Leu Gln Ala Val Ala Pro
 50 55 60
 Thr Ser Cys Leu Glu Asn Ser Ser Leu Glu His Thr Val His Arg Glu
 65 70 75 80
 Lys Thr Gly Lys Gly Leu Ser Ala Thr Arg Leu Ser Ala Ser Ser Glu
 85 90 95
 Asp Ile Ser Asp Arg Leu Ala Gly Val Ser Val Gly Leu Pro Ser Ser
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 Thr Thr Thr Glu Gln Pro Lys Pro Ala Val Gln Thr Lys Gly Arg Pro
 115 120 125
 His Ser Gln Cys Leu Asn Ser Ser Pro Leu Ser His Ala Gln Leu Met
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 Phe Pro Ala Pro Ser Ala Pro Cys Ser Ser Ala Pro Ser Val Pro Asp
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 Ile Ser Lys His Arg Pro Gln Ala Phe Val Pro Cys Lys Ile Pro Ser
 165 170 175
 Ala Ser Pro Gln Thr Gln Arg Lys Phe Ser Leu Gln Phe Gln Arg Asn
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 Cys Ser Glu His Arg Asp Ser Asp Gln Leu Ser Pro Val Phe Thr Gln
 195 200 205
 Ser Arg Pro Pro Pro Ser Ser Asn Ile His Arg Pro Lys Pro Ser Arg
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 Pro Val Pro Gly Ser Thr Ser Lys Leu Gly Asp Ala Thr Lys Ser Ser
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 Met Thr Leu Asp Leu Gly Ser Ala Ser Arg Cys Asp Asp Ser Phe Gly
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 Gly Gly Gly Asn Ser Gly Asn Ala Val Ile Pro Ser Asp Glu Thr Val
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 Phe Thr Pro Val Glu Asp Lys Cys Arg Leu Asp Val Asn Thr Glu Leu
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 Thr Thr Val Thr Phe Lys Ser Glu Val Ala Val Leu Ser Pro Glu Lys
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 Ala Glu Asn Asp Asp Thr Tyr Lys Asp Asp Val Asn His Asn Gln Lys
 325 330 335
 Cys Lys Glu Lys Met Glu Ala Glu Glu Glu Glu Ala Leu Ala Ile Ala

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Gln	Val	Glu	Asn	Gly	Glu	Asp	Ile	Ile	Ile	Ile	Gln	Gln	Asp	Thr	Pro				
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Glu	Thr	Leu	Pro	Gly	His	Thr	Lys	Ala	Lys	Gln	Pro	Tyr	Arg	Glu	Asp				
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Cys	Tyr	Gln	Ala	Gln	Asp	Val	Gly	Thr	Gly	Thr	Leu	Met	Ala	Val	Lys				
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Gln	Val	Thr	Tyr	Val	Arg	Asn	Thr	Ser	Ser	Glu	Gln	Glu	Glu	Val	Val				
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Glu	Ala	Leu	Arg	Glu	Glu	Ile	Arg	Met	Met	Gly	His	Leu	Asn	His	Pro				
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Leu	Phe	Ile	Glu	Trp	Met	Ala	Gly	Gly	Ser	Val	Ala	His	Leu	Leu	Ser				
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Lys	Tyr	Gly	Ala	Phe	Lys	Glu	Ser	Val	Val	Ile	Asn	Tyr	Thr	Glu	Gln				
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Leu	Leu	Arg	Gly	Leu	Ser	Tyr	Leu	His	Glu	Asn	Gln	Ile	Ile	His	Arg				
		515					520					525							
Asp	Val	Lys	Gly	Ala	Asn	Leu	Leu	Ile	Asp	Ser	Thr	Gly	Gln	Arg	Leu				
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Arg	Ile	Ala	Asp	Phe	Gly	Ala	Ala	Ala	Arg	Leu	Ala	Ser	Lys	Gly	Thr				
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Ala	Pro	Glu	Val	Leu	Arg	Gly	Gln	Gln	Tyr	Gly	Arg	Ser	Cys	Asp	Val				
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Trp	Ser	Val	Gly	Cys	Ala	Ile	Ile	Glu	Met	Ala	Cys	Ala	Lys	Pro	Pro				
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Trp	Asn	Ala	Glu	Lys	His	Ser	Asn	His	Leu	Ala	Leu	Ile	Phe	Lys	Ile				
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Ala	Ser	Ala	Thr	Thr	Ala	Pro	Ser	Ile	Pro	Ser	His	Leu	Ser	Pro	Gly				
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Leu	Arg	Asp	Val	Ala	Val	Arg	Cys	Leu	Glu	Leu	Gln	Pro	Gln	Asp	Arg				
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 Gly Phe Pro Gly Ala Ala Ala Ala Ser Pro Glu Ala Gly Gly Gly Gly
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gga gga gga gga gct ctc cag gga agc ggc gcg ccc gca gcg ggc gcg 146
 Gly Gly Gly Gly Ala Leu Gln Gly Ser Gly Ala Pro Ala Ala Gly Ala
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gcg ggg ctg ctg cgg gag cct ggc agc gcg ggc cgc gag cgc gcg gac 194
 Ala Gly Leu Leu Arg Glu Pro Gly Ser Ala Gly Arg Glu Arg Ala Asp
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tgg cgg cgg cgg cac gtg cgc aaa gtg cgg agt gtg gag ctg gac cag 242
 Trp Arg Arg Arg His Val Arg Lys Val Arg Ser Val Glu Leu Asp Gln
 65 70 75

ctg ccg gag cag ccg ctc ttc ctc gcc gcc gcc tcg ccg ccc tgc cca 290
 Leu Pro Glu Gln Pro Leu Phe Leu Ala Ala Ala Ser Pro Pro Cys Pro
 80 85 90

tct act tcc ccg tcg ccg gag ccc gcg gac gcg gct gca gga gcg agt 338
 Ser Thr Ser Pro Ser Pro Glu Pro Ala Asp Ala Ala Gly Ala Ser
 95 100 105

cgc ttc cag ccc gcg gcg gga ccg cca ccc ccg gga gcg gcg agt cgc 386
 Arg Phe Gln Pro Ala Ala Gly Pro Pro Pro Pro Gly Ala Ala Ser Arg
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tgc ggc tcc cac tct gcc gag ctg gcg gcc gcg cgg gac agc ggc gcc 434
 Cys Gly Ser His Ser Ala Glu Leu Ala Ala Ala Arg Asp Ser Gly Ala
 125 130 135 140

cgg agc ccc gcg ggg gcg gag ccg ccc tct gca gcg gcc ccc tcc ggt 482
 Arg Ser Pro Ala Gly Ala Glu Pro Pro Ser Ala Ala Ala Pro Ser Gly
 145 150 155

cga gag atg gag aat aaa gaa acc ctc aaa gga ctg cac aag atg gag 530
 Arg Glu Met Glu Asn Lys Glu Thr Leu Lys Gly Leu His Lys Met Glu
 160 165 170

gat cgc ccg gag gag aga atg atc cgg gag aag ctc aag gcg acc tgt 578
 Asp Arg Pro Glu Glu Arg Met Ile Arg Glu Lys Leu Lys Ala Thr Cys
 175 180 185

atg ccg gcc tgg aag cac gag tgg ttg gag agg agg aac agg aga ggc 626

Met	Pro	Ala	Trp	Lys	His	Glu	Trp	Leu	Glu	Arg	Arg	Asn	Arg	Arg	Gly		
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cct	gtg	gtg	gtg	aag	cca	atc	cct	att	aaa	gga	gat	gga	tct	gaa	gtg	674	
Pro	Val	Val	Val	Lys	Pro	Ile	Pro	Ile	Lys	Gly	Asp	Gly	Ser	Glu	Val		
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aat	aac	ttg	gca	gct	gag	ccc	cag	gga	gag	ggc	cag	gca	ggt	tcc	gct	722	
Asn	Asn	Leu	Ala	Ala	Glu	Pro	Gln	Gly	Glu	Gly	Gln	Ala	Gly	Ser	Ala		
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gca	cca	gcc	ccc	aag	ggc	cga	cga	agc	cca	tct	cct	ggc	agc	tct	ccg	770	
Ala	Pro	Ala	Pro	Lys	Gly	Arg	Arg	Ser	Pro	Ser	Pro	Gly	Ser	Ser	Pro		
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tca	ggg	cgc	tcg	gtg	aag	ccg	gaa	tcc	cca	gga	gta	aga	cgg	aaa	cga	818	
Ser	Gly	Arg	Ser	Val	Lys	Pro	Glu	Ser	Pro	Gly	Val	Arg	Arg	Lys	Arg		
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gtg	tcc	ccg	gtg	cct	ttc	cag	agt	ggc	aga	atc	aca	cca	ccc	cga	aga	866	
Val	Ser	Pro	Val	Pro	Phe	Gln	Ser	Gly	Arg	Ile	Thr	Pro	Pro	Arg	Arg		
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gcc	cca	tca	ccg	gat	ggc	ttc	tcc	ccg	tac	agc	cca	gag	gag	acg	agc	914	
Ala	Pro	Ser	Pro	Asp	Gly	Phe	Ser	Pro	Tyr	Ser	Pro	Glu	Glu	Thr	Ser		
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cgc	cgc	gtg	aac	aaa	gtg	atg	aga	gcc	agg	ctg	tac	ctg	ctg	cag	cag	962	
Arg	Arg	Val	Asn	Lys	Val	Met	Arg	Ala	Arg	Leu	Tyr	Leu	Leu	Gln	Gln		
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ata	gga	ccc	aac	tct	ttc	ctg	att	gga	gga	gac	agt	cca	gac	aat	aaa	1010	
Ile	Gly	Pro	Asn	Ser	Phe	Leu	Ile	Gly	Gly	Asp	Ser	Pro	Asp	Asn	Lys		
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tac	cgg	gtg	ttt	att	ggg	cca	cag	aac	tgc	agc	tgt	ggg	cgt	gga	gca	1058	
Tyr	Arg	Val	Phe	Ile	Gly	Pro	Gln	Asn	Cys	Ser	Cys	Gly	Arg	Gly	Ala		
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ttc	tgt	att	cac	ctc	ttg	ttt	gtc	atg	ctc	cgg	gtg	ttt	cag	cta	gaa	1106	
Phe	Cys	Ile	His	Leu	Leu	Phe	Val	Met	Leu	Arg	Val	Phe	Gln	Leu	Glu		
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ccc	tct	gac	ccc	atg	tta	tgg	aga	aaa	act	tta	aaa	aat	ttc	gag	gtt	1154	
Pro	Ser	Asp	Pro	Met	Leu	Trp	Arg	Lys	Thr	Leu	Lys	Asn	Phe	Glu	Val		
365					370					375					380		
gag	agt	ttg	ttc	cag	aaa	tac	cac	agt	agg	cgt	agc	tcg	aga	atc	aaa	1202	
Glu	Ser	Leu	Phe	Gln	Lys	Tyr	His	Ser	Arg	Arg	Ser	Ser	Arg	Ile	Lys		
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gct	cca	tcc	cgg	aac	acc	atc	cag	aag	ttt	gtg	tca	cgc	atg	tca	aat	1250	
Ala	Pro	Ser	Arg	Asn	Thr	Ile	Gln	Lys	Phe	Val	Ser	Arg	Met	Ser	Asn		
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tct	cac	aca	ctg	tca	tcg	tct	agc	aca	tcc	aca	tct	agt	tca	gaa	aac	1298	
Ser	His	Thr	Leu	Ser	Ser	Ser	Ser	Thr	Ser	Thr	Ser	Ser	Ser	Ser	Glu	Asn	
			415					420					425				
agc	atc	aag	gat	gaa	gag	gag	cag	atg	tgt	ccc	atc	tgc	ttg	ctg	ggc	1346	
Ser	Ile	Lys	Asp	Glu	Glu	Glu	Gln	Met	Cys	Pro	Ile	Cys	Leu	Leu	Gly		

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Met Leu Asp Glu Glu Ser Leu Thr Val Cys Glu Asp Gly Cys Arg Asn			
445	450	455	460
aag ctg cac cac cat tgc atg tcc atc tgg gcg gaa gag tgt aga aga			1442
Lys Leu His His His Cys Met Ser Ile Trp Ala Glu Glu Cys Arg Arg			
	465	470	475
aat aga gag cct tta ata tgt ccc ctt tgt aga tct aag tgg aga tcc			1490
Asn Arg Glu Pro Leu Ile Cys Pro Leu Cys Arg Ser Lys Trp Arg Ser			
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cat gac ttc tac agc cat gag tta tca agc ccc gtg gag tcc ccc gcc			1538
His Asp Phe Tyr Ser His Glu Leu Ser Ser Pro Val Glu Ser Pro Ala			
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Ser Leu Arg Ala Val Gln Gln Pro Ser Ser Pro Gln Gln Pro Val Ala			
	510	515	520
gga tca cag cgg agg aat cag gag agc agt ttt aac ctt act cat ttt			1634
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Gly Thr Gln Gln Ile Pro Ser Ala Tyr Lys Asp Leu Ala Glu Pro Trp			
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Trp Asn Val Arg Glu Met Ala Leu Arg Arg Leu Ser His Asp Val Ser			
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ggg gcc ctg ttg ttg gca aac ggg gag agc act gga aac tct gga gcc			1826
Gly Ala Leu Leu Leu Ala Asn Gly Glu Ser Thr Gly Asn Ser Gly Gly			
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ggc agt ggg ggc agc tta agc gcg gga gcg gcc agc ggg tcc tcc cag			1874
Gly Ser Gly Gly Ser Leu Ser Ala Gly Ala Ala Ser Gly Ser Ser Gln			
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ccc agc atc tca ggg gat gtg gtg gag gcg tgc tgc agt gtc ctg tct			1922
Pro Ser Ile Ser Gly Asp Val Val Glu Ala Cys Cys Ser Val Leu Ser			
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Ile Val Cys Ala Asp Pro Val Tyr Lys Val Tyr Val Ala Ala Leu Lys			
	640	645	650
aca ttg aga gcc atg ctg gta tac act cct tgc cac agt ctg gca gaa			2018
Thr Leu Arg Ala Met Leu Val Tyr Thr Pro Cys His Ser Leu Ala Glu			
	655	660	665
aga atc aaa ctt cag aga ctc ctc cgg cca gtt gta gac act atc ctt			2066
Arg Ile Lys Leu Gln Arg Leu Leu Arg Pro Val Val Asp Thr Ile Leu			
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aga gaa ata ctt aaa gct ggg tcc atc ggg gtt ggt ggt gtc gat tac Arg Glu Ile Leu Lys Ala Gly Ser Ile Gly Val Gly Gly Val Asp Tyr 720 725 730	2210
gtc tta agt tgt atc ctt gga aac caa gct gaa tca aac aac tgg caa Val Leu Ser Cys Ile Leu Gly Asn Gln Ala Glu Ser Asn Asn Trp Gln 735 740 745	2258
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cct gct gaa ttc tat cct cat att gtc agt act gat gtc tca caa gct Pro Ala Glu Phe Tyr Pro His Ile Val Ser Thr Asp Val Ser Gln Ala 765 770 775 780	2354
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Gly Val Ser Val Gly Leu Pro Ser Ser Thr Thr Thr Glu Gln Pro Lys	
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Cys Ser Ser Ala Pro Ser Val Pro Asp Ile Ser Lys His Arg Pro Gln	
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Ala Ser Arg Cys Asp Asp Ser Phe Gly Gly Gly Gly Asn Ser Gly Asn	
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Ala Val Ile Pro Ser Asp Glu Thr Val Phe Thr Pro Val Glu Asp Lys	
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Cys Arg Leu Asp Val Asn Thr Glu Leu Asn Ser Ser Ile Glu Asp Leu	
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Leu Glu Ala Ser Met Pro Ser Ser Asp Thr Thr Val Thr Phe Lys Ser	
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Glu Val Ala Val Leu Ser Pro Glu Lys Ala Glu Asn Asp Asp Thr Tyr	
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 His Val Arg Lys Val Arg Ser Val Glu Leu Asp Gln Leu Pro Glu Gln
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 Pro Leu Phe Leu Ala Ala Ala Ser Pro Pro Cys Pro Ser Thr Ser Pro
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 Gly Ala Glu Pro Pro Ser Ala Ala Ala Pro Ser Gly Arg Glu Met Glu
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 Asn Lys Glu Thr Leu Lys Gly Leu His Lys Met Glu Asp Arg Pro Glu
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 Lys His Glu Trp Leu Glu Arg Arg Asn Arg Arg Gly Pro Val Val Val
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 Lys Gly Arg Arg Ser Pro Ser Pro Gly Ser Ser Pro Ser Gly Arg Ser
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 Pro Phe Gln Ser Gly Arg Ile Thr Pro Pro Arg Arg Ala Pro Ser Pro
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 Asp Gly Phe Ser Pro Tyr Ser Pro Glu Glu Thr Ser Arg Arg Val Asn
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 Lys Ala Gly Ser Ile Gly Val Gly Gly Val Asp Tyr Val Leu Ser Cys
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 Ile Leu Gly Asn Gln Ala Glu Ser Asn Asn Trp Gln Glu Leu Leu Gly
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Pro Ala Ser Lys Gly Arg Arg Ser Pro Ser Pro Gly Asn Ser Pro Ser	
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Pro Ser Pro Asp Gly Phe Ser Pro Tyr Ser Pro Glu Glu Thr Asn Arg			
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Arg Val Asn Lys Val Met Arg Ala Arg Leu Tyr Leu Leu Gln Gln Ile			
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Cys Ile His Leu Leu Phe Val Met Leu Arg Val Phe Gln Leu Glu Pro			
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Ser Asp Pro Met Leu Trp Arg Lys Thr Leu Lys Asn Phe Glu Val Glu			
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Ser Leu Phe Gln Lys Tyr His Ser Arg Arg Ser Ser Arg Ile Lys Ala			
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Ile Leu Lys Ala Gly Ser Ile Gly Val Gly Gly Val Asp Tyr Val Leu	
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Ser Cys Ile Leu Gly Asn Gln Ala Glu Ser Asn Asn Trp Gln Glu Leu	
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Leu Gly Arg Leu Cys Leu Ile Asp Arg Leu Leu Leu Glu Phe Pro Ala	
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Glu Phe Tyr Pro His Ile Val Ser Thr Asp Val Ser Gln Ala Glu Pro	
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Val Glu Ile Arg Tyr Lys Lys Leu Leu Ser Leu Leu Thr Phe Ala Leu	
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Gln Ser Ile Asp Asn Ser His Ser Met Val Gly Lys Leu Ser Arg Arg	
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Ile Tyr Leu Ser Ser Ala Arg Met Val Thr Ala Val Pro Ala Val Phe	
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Ser Lys Leu Val Thr Met Leu Asn Ala Ser Gly Ser Thr His Phe Thr	
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Arg Met Arg Arg Arg Leu Met Ala Ile Ala Asp Glu Val Glu Ile Ala	
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Glu Val Ile Gln Leu Gly Val Glu Asp Thr Val Asp Gly His Gln Asp	
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Ser Leu Gln Ala Leu Ala Pro Ala Ser Cys Leu Glu Asn Ser Ser Leu	
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Glu His Thr Val His Arg Glu Lys Thr Gly Lys Gly Leu Ser Ala Thr	
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Arg Leu Ser Ala Ser Ser Glu Asp Ile Ser Asp Arg Leu Ala Gly Val	
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Ser Val Gly Leu Pro Ser Ser Thr Thr Thr Glu Gln Pro Lys Pro Ala	
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Val Gln Thr Lys Gly Arg Pro His Ser Gln Cys Leu Asn Ser Ser Pro	
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Val 800	Pro	Cys	Lys	Ile	Pro 805	Ser	Ala	Ser	Pro	Gln 810	Thr	Gln	Arg	Lys	Phe 815	
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His	Arg	Pro	Lys	Pro	Ser	Arg	Pro	Val	Pro	Gly	Ser	Thr	Ser	Lys	Leu	
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Gly	Asp	Ala	Thr	Lys	Ser	Ser	Met	Thr	Leu	Asp	Leu	Gly	Ser	Ala	Ser	
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Arg	Cys	Asp	Asp	Ser	Phe	Gly	Gly	Gly	Gly	Asn	Ser	Gly	Asn	Ala	Val	
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ata	ccc	agc	gac	gag	aca	gtg	ttc	acg	ccg	gtg	gag	gac	aag	tgc	agg	2735
Ile	Pro	Ser	Asp	Glu	Thr	Val	Phe	Thr	Pro	Val	Glu	Asp	Lys	Cys	Arg	
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gca	tcc	atg	cct	tca	agt	gac	acg	aca	gtc	act	ttc	aag	tcc	gaa	gtc	2831
Ala	Ser	Met	Pro	Ser	Ser	Asp	Thr	Thr	Val	Thr	Phe	Lys	Ser	Glu	Val	
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gcc	gtc	ctc	tct	ccg	gaa	aag	gcc	gaa	aat	gac	gac	acc	tac	aaa	gac	2879
Ala	Val	Leu	Ser	Pro	Glu	Lys	Ala	Glu	Asn	Asp	Asp	Thr	Tyr	Lys	Asp	
	945					950					955					
gac	gtc	aat	cat	aat	caa	aag	tgc	aaa	gaa	aag	atg	gaa	gct	gaa	gag	2927
Asp	Val	Asn	His	Asn	Gln	Lys	Cys	Lys	Glu	Lys	Met	Glu	Ala	Glu	Glu	
	960			965						970				975		
gag	gag	gct	tta	gcg	atc	gcc	atg	gcg	atg	tca	gcg	tct	cag	gat	gcc	2975
Glu	Glu	Ala	Leu	Ala	Ile	Ala	Met	Ala	Met	Ser	Ala	Ser	Gln	Asp	Ala	
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ctc	ccc	atc	gtc	cct	cag	ctg	cag	gtg	gaa	aat	gga	gaa	gat	att	atc	3023
Leu	Pro	Ile	Val	Pro	Gln	Leu	Gln	Val	Glu	Asn	Gly	Glu	Asp	Ile	Ile	
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Ile	Ile	Gln	Gln	Asp	Thr	Pro	Glu	Thr	Leu	Pro	Gly	His	Thr	Lys	Ala	
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Lys	Gln	Pro	Tyr	Arg	Glu	Asp	Ala	Glu	Trp	Leu	Lys	Gly	Gln	Gln	Ile	
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Gly	Leu	Gly	Ala	Phe	Ser	Ser	Cys	Tyr	Gln	Ala	Gln	Asp	Val	Gly	Thr	

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Gly Thr Leu Met Ala Val Lys Gln Val Thr Tyr Val Arg Asn Thr Ser				
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tct gag caa gaa gaa gta gta gaa gca cta aga gaa gag ata aga atg				3263
Ser Glu Gln Glu Glu Val Val Glu Ala Leu Arg Glu Glu Ile Arg Met				
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Met Ser His Leu Asn His Pro Asn Ile Ile Arg Met Leu Gly Ala Thr				
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Cys Glu Lys Ser Asn Tyr Asn Leu Phe Ile Glu Trp Met Ala Gly Gly				
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Ser Val Ala His Leu Leu Ser Lys Tyr Gly Ala Phe Lys Glu Ser Val				
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Val Ile Asn Tyr Thr Glu Gln Leu Leu Arg Gly Leu Ser Tyr Leu His				
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Glu Asn Gln Ile Ile His Arg Asp Val Lys Gly Ala Asn Leu Leu Ile				
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Asp Ser Thr Gly Gln Arg Leu Arg Ile Ala Asp Phe Gly Ala Ala Ala				
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Arg Leu Ala Ser Lys Gly Thr Gly Ala Gly Glu Phe Gln Gly Gln Leu				
1185		1190	1195	
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Leu Gly Thr Ile Ala Phe Met Ala Pro Glu Val Leu Arg Gly Gln Gln				
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tat ggt agg agc tgt gat gta tgg agt gtt ggc tgc gcc att ata gaa				3695
Tyr Gly Arg Ser Cys Asp Val Trp Ser Val Gly Cys Ala Ile Ile Glu				
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Met Ala Cys Ala Lys Pro Pro Trp Asn Ala Glu Lys His Ser Asn His				
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ctc gcc ttg ata ttt aag att gct agc gca act act gca ccg tcc atc				3791
Leu Ala Leu Ile Phe Lys Ile Ala Ser Ala Thr Thr Ala Pro Ser Ile				
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ccg tca cac ctg tcc cct ggt tta cga gat gtg gct ctt cgt tgt tta				3839
Pro Ser His Leu Ser Pro Gly Leu Arg Asp Val Ala Leu Arg Cys Leu				
1265		1270	1275	
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Glu Leu Gln Pro Gln Asp Arg Pro Pro Ser Arg Glu Leu Leu Lys His				
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 Pro Val Phe Arg Thr Thr Trp
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3911

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 Ala Ser Lys Gly Arg Arg Ser Pro Ser Pro Gly Asn Ser Pro Ser Gly
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 Arg Thr Val Lys Ser Glu Ser Pro Gly Val Arg Arg Lys Arg Val Ser
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 Pro Val Pro Phe Gln Ser Gly Arg Ile Thr Pro Pro Arg Arg Ala Pro
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 Ser Pro Asp Gly Phe Ser Pro Tyr Ser Pro Glu Glu Thr Asn Arg Arg
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 Val Asn Lys Val Met Arg Ala Arg Leu Tyr Leu Leu Gln Gln Ile Gly
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 Pro Asn Ser Phe Leu Ile Gly Gly Asp Ser Pro Asp Asn Lys Tyr Arg
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 Val Phe Ile Gly Pro Gln Asn Cys Ser Cys Ala Arg Gly Thr Phe Cys
 145 150 155 160
 Ile His Leu Leu Phe Val Met Leu Arg Val Phe Gln Leu Glu Pro Ser
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 Asp Pro Met Leu Trp Arg Lys Thr Leu Lys Asn Phe Glu Val Glu Ser
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 Leu Phe Gln Lys Tyr His Ser Arg Arg Ser Ser Arg Ile Lys Ala Pro
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 Thr Leu Ser Ser Ser Ser Thr Ser Thr Ser Ser Ser Val Asn Ser Ile
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 Lys Asp Glu Glu Glu Gln Met Cys Pro Ile Cys Leu Leu Gly Met Leu
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 Asp Glu Glu Ser Leu Thr Val Cys Glu Asp Gly Cys Arg Asn Lys Leu

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Phe	Tyr	Ser	His	Glu	Leu	Ser	Ser	Pro	Val	Asp	Ser	Pro	Ser	Ser	Leu				
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 Ser Ala Ala Ala Pro Ser Gly Arg Glu Met Glu Asn Lys Glu Thr Leu
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Lys Gly Leu His Lys Met Asp Asp Arg Pro Glu Glu Arg Met Ile Arg
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 Glu Arg Arg Asn Arg Arg Gly Pro Val Val Val Lys Pro Ile Pro Ile
 195 200 205
 Lys Gly Asp Gly Ser Glu Met Ser Asn Leu Ala Ala Glu Leu Gln Gly
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 Glu Gly Gln Ala Gly Ser Ala Ala Pro Ala Pro Lys Gly Arg Arg Ser
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 Pro Ser Pro Gly Ser Ser Pro Ser Gly Arg Ser Gly Lys Pro Glu Ser
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 Pro Gly Val Arg Arg Lys Arg Val Ser Pro Val Pro Phe Gln Ser Gly
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 Arg Ile Thr Pro Pro Arg Arg Ala Pro Ser Pro Asp Gly Phe Ser Pro
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 Tyr Ser Pro Glu Glu Thr Ser Arg Arg Val Asn Lys Val Met Arg Ala
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 Arg Leu Tyr Leu Leu Gln Gln Ile Gly Pro Asn Ser Phe Leu Ile Gly
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 Cys Glu Asp Gly Cys Arg Asn Lys Leu His His His Cys Met Ser Ile
 450 455 460
 Trp Ala Glu Glu Cys Arg Arg Asn Arg Glu Pro Leu Ile Cys Pro Leu
 465 470 475 480
 Cys Arg Ser Lys Trp Arg Ser His Asp Phe Tyr Ser His Glu Leu Ser

				485				490				495			
Ser	Pro	Val	Asp 500	Ser	Pro	Thr	Ser	Leu 505	Arg	Gly	Val	Gln	Gln	Pro	Ser
Ser	Pro	Gln 515	Gln	Pro	Val	Ala	Gly 520	Ser	Gln	Arg	Arg	Asn 525	Gln	Glu	Ser
Asn	Phe 530	Asn	Leu	Thr	His	Tyr 535	Gly	Thr	Gln	Gln	Ile 540	Pro	Pro	Ala	Tyr
Lys 545	Asp	Leu	Ala	Glu	Pro 550	Trp	Ile	Gln	Ala	Phe 555	Gly	Met	Glu	Leu	Val 560
Gly	Cys	Leu	Phe	Ser 565	Arg	Asn	Trp	Asn	Val 570	Arg	Glu	Met	Ala	Leu 575	Arg
Arg	Leu	Ser	His 580	Asp	Val	Ser	Gly	Ala 585	Leu	Leu	Leu	Ala	Asn 590	Gly	Glu
Ser	Thr	Gly 595	Thr	Ser	Gly	Gly	Gly 600	Ser	Gly	Gly	Ser	Leu 605	Ser	Ala	Gly
Ala	Ala 610	Ser	Gly	Ser	Ser	Gln 615	Pro	Ser	Ile	Ser	Gly 620	Asp	Val	Val	Glu
Ala 625	Phe	Cys	Ser	Val	Leu 630	Ser	Ile	Val	Cys	Ala 635	Asp	Pro	Val	Tyr	Lys 640
Val	Tyr	Val	Ala	Ala 645	Leu	Lys	Thr	Leu	Arg 650	Ala	Met	Leu	Val	Tyr 655	Thr
Pro	Cys	His	Ser 660	Leu	Ala	Glu	Arg	Ile 665	Lys	Leu	Gln	Arg	Leu 670	Leu	Arg
Pro	Val	Val 675	Asp	Thr	Ile	Leu	Val 680	Lys	Cys	Ala	Asp	Ala 685	Asn	Ser	Arg
Thr	Ser 690	Gln	Leu	Ser	Ile	Ser 695	Thr	Leu	Leu	Glu	Leu 700	Cys	Lys	Gly	Gln
Ala 705	Gly	Glu	Leu	Ala	Val 710	Gly	Arg	Glu	Ile	Leu 715	Lys	Ala	Gly	Ser	Ile 720
Gly	Val	Gly	Gly	Val 725	Asp	Tyr	Val	Leu	Ser 730	Cys	Ile	Leu	Gly	Asn 735	Gln
Ala	Glu	Ser	Asn 740	Asn	Trp	Gln	Glu	Leu 745	Leu	Gly	Arg	Leu	Cys 750	Leu	Ile
Asp	Arg	Leu 755	Leu	Leu	Glu	Ile	Ser 760	Ala	Glu	Phe	Tyr	Pro 765	His	Ile	Val
Ser	Thr 770	Asp	Val	Ser	Gln	Ala 775	Glu	Pro	Val	Glu	Ile 780	Arg	Tyr	Lys	Lys
Leu 785	Leu	Ser	Leu	Leu	Ala 790	Phe	Ala	Leu	Gln	Ser 795	Ile	Asp	Asn	Ser	His 800
Ser	Met	Val	Gly 805	Lys	Leu	Ser	Arg	Arg	Ile 810	Tyr	Leu	Ser	Ser	Ala 815	Arg

Met Val Thr Thr Val Pro Pro Leu Phe Ser Lys Leu Val Thr Met Leu
 820 825 830
 Ser Ala Ser Gly Ser Ser His Phe Ala Arg Met Arg Arg Arg Leu Met
 835 840 845
 Ala Ile Ala Asp Glu Val Glu Ile Ala Glu Val Ile Gln Leu Gly Ser
 850 855 860
 Glu Asp Thr Leu Asp Gly Gln Gln Asp Ser Ser Gln Ala Leu Ala Pro
 865 870 875 880
 Pro Arg Tyr Pro Glu Ser Ser Ser Leu Glu His Thr Ala His Val Glu
 885 890 895
 Lys Thr Gly Lys Gly Leu Lys Ala Thr Arg Leu Ser Ala Ser Ser Glu
 900 905 910
 Asp Ile Ser Asp Arg Leu Ala Gly Val Ser Val Gly Leu Pro Ser Ser
 915 920 925
 Ala Thr Thr Glu Gln Pro Lys Pro Thr Val Gln Thr Lys Gly Arg Pro
 930 935 940
 His Ser Gln Cys Leu Asn Ser Ser Pro Leu Ser Pro Pro Gln Leu Met
 945 950 955 960
 Phe Pro Ala Ile Ser Ala Pro Cys Ser Ser Ala Pro Ser Val Pro Ala
 965 970 975
 Gly Ser Val Thr Asp Ala Ser Lys His Arg Pro Arg Ala Phe Val Pro
 980 985 990
 Cys Lys Ile Pro Ser Ala Ser Pro Gln Thr Gln Arg Lys Phe Ser Leu
 995 1000 1005
 Gln Phe Gln Arg Thr Cys Ser Glu Asn Arg Asp Ser Glu Lys Leu Ser
 1010 1015 1020
 Pro Val Phe Thr Gln Ser Arg Pro Pro Pro Ser Ser Asn Ile His Arg
 1025 1030 1035 1040
 Ala Lys Ala Ser Arg Pro Val Pro Gly Ser Thr Ser Lys Leu Gly Asp
 1045 1050 1055
 Ala Ser Lys Asn Ser Met Thr Leu Asp Leu Asn Ser Ala Ser Gln Cys
 1060 1065 1070
 Asp Asp Ser Phe Gly Ser Gly Ser Asn Ser Gly Ser Ala Val Ile Pro
 1075 1080 1085
 Ser Glu Glu Thr Ala Phe Thr Pro Ala Glu Asp Lys Cys Arg Leu Asp
 1090 1095 1100
 Val Asn Pro Glu Leu Asn Ser Ser Ile Glu Asp Leu Leu Glu Ala Ser
 1105 1110 1115 1120
 Met Pro Ser Ser Asp Thr Thr Val Thr Phe Lys Ser Glu Val Ala Val
 1125 1130 1135

Leu Ser Pro Glu Lys Ala Glu Ser Asp Asp Thr Tyr Lys Asp Asp Val
 1140 1145 1150
 Asn His Asn Gln Lys Cys Lys Glu Lys Met Glu Ala Glu Glu Glu
 1155 1160 1165
 Ala Leu Ala Ile Ala Met Ala Met Ser Ala Ser Gln Asp Ala Leu Pro
 1170 1175 1180
 Ile Val Pro Gln Leu Gln Val Glu Asn Gly Glu Asp Ile Ile Ile Ile
 1185 1190 1195 1200
 Gln Ala Asp Thr Pro Glu Thr Leu Pro Gly His Thr Lys Ala Asn Glu
 1205 1210 1215
 Pro Tyr Arg Glu Asp Thr Glu Trp Leu Lys Gly Gln Gln Ile Gly Leu
 1220 1225 1230
 Gly Ala Phe Ser Ser Cys Tyr Gln Ala Gln Asp Val Gly Thr Gly Thr
 1235 1240 1245
 Leu Met Ala Val Lys Gln Val Thr Tyr Val Arg Asn Thr Ser Ser Glu
 1250 1255 1260
 Gln Glu Glu Val Val Glu Ala Leu Arg Glu Glu Ile Arg Met Met Ser
 1265 1270 1275 1280
 His Leu Asn His Pro Asn Ile Ile Arg Met Leu Gly Ala Thr Cys Glu
 1285 1290 1295
 Lys Ser Asn Tyr Asn Leu Phe Ile Glu Trp Met Ala Gly Ala Ser Val
 1300 1305 1310
 Ala His Leu Leu Ser Lys Tyr Gly Ala Phe Lys Glu Ser Val Val Ile
 1315 1320 1325
 Asn Tyr Thr Glu Gln Leu Leu Arg Gly Leu Ser Tyr Leu His Glu Asn
 1330 1335 1340
 Gln Ile Ile His Arg Asp Val Lys Gly Ala Asn Leu Leu Ile Asp Ser
 1345 1350 1355 1360
 Thr Gly Gln Arg Leu Arg Ile Ala Asp Phe Gly Ala Ala Ala Arg Leu
 1365 1370 1375
 Ala Ser Lys Gly Thr Gly Ala Gly Glu Phe Gln Gly Gln Leu Leu Gly
 1380 1385 1390
 Thr Ile Ala Phe Met Ala Pro Glu Val Leu Arg Gly Gln Gln Tyr Gly
 1395 1400 1405
 Arg Ser Cys Asp Val Trp Ser Val Gly Cys Ala Ile Ile Glu Met Ala
 1410 1415 1420
 Cys Ala Lys Pro Pro Trp Asn Ala Glu Lys His Ser Asn His Leu Ala
 1425 1430 1435 1440
 Leu Ile Phe Lys Ile Ala Ser Ala Thr Thr Ala Pro Ser Ile Pro Ser
 1445 1450 1455
 His Leu Ser Pro Gly Leu Arg Asp Val Ala Leu Arg Cys Leu Glu Leu

146C

1465

1470

Gln Pro Gln Asp Arg Pro Pro Ser Arg Glu Leu Leu Lys His Pro Val
1475 1480 1485

Phe Arg Thr Thr Trp
1490